

6-6 Analyzing Graphs of Quadratic Functions

Vertex Form

$$y = a(x-h)^2 + k$$

Vertex (h, k)

a.o.s. $x = h$

Write the equation in vertex form.

ex

$$y = x^2 - 6x + 11$$

$$\begin{aligned} y - 11 &= x^2 - 6x + 9 \\ &\quad +9 \\ y - 2 &= (x - 3)^2 & V(3, 2) \\ y &= (x - 3)^2 + 2 \end{aligned}$$

Graph it!

h translates the graph horizontally

k translates the graph vertically

a controls the direction and opening

Write the equation in vertex form.

ex

$$y = 3x^2 + 2x$$

$$\begin{aligned} &\frac{1}{2} \cdot \frac{2}{3} = \left(\frac{1}{3}\right)^2 \\ y &= 3\left(x^2 + \frac{2}{3}x + \frac{1}{9}\right) \\ &\quad + \frac{1}{3} \\ y + \frac{1}{3} &= 3\left(x + \frac{1}{3}\right)^2 \\ y &= 3\left(x + \frac{1}{3}\right)^2 - \frac{1}{3} \\ &V\left(-\frac{1}{3}, -\frac{1}{3}\right) \end{aligned}$$

Write the equation in vertex form.

ex

$$y = -2x^2 + 20x - 35$$

$$y + 35 = -2x^2 + 20x$$

$$y + 35 - 50 = -2(x^2 - 10x + 25)$$

What did I do?
Really add!

$$y - 15 = -2(x - 5)^2$$

$$y = -2(x - 5)^2 + 15$$

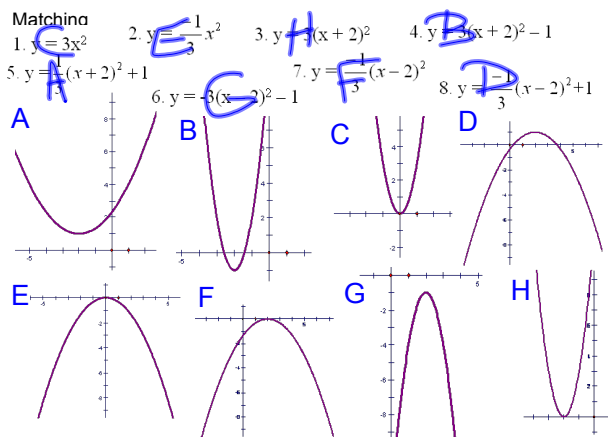
Write the equation in vertex form.

ex

$$y = 4x^2 + 2$$

$$V(0, 2)$$

Matching



HW
p326
15-31 odd